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August 8, 1977-60¢

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WEAPONS EXPERT SAMUEL COHEN EXPLAINS HOW THE U.S. GOT A 'CLEAN' NUKE IN ITS ARSENAL

"I have not yet decided whether to advocate deployment of the neutron bomb," President Carter said last month. "I do think it ought to be one of our options." With these words Carter began the process that could move the newest nuclear weapon from the laboratory, where it has been under development since 1959, to the armed forces, including NATO. Hailed grimly as "the ultimate capitalist weapon," because it kills personnel by radiation while leaving buildings and equipment intact, the neutron bomb has won the approval of NATO commander Gen. Alexander Haig and nuclear physicist Edward Teller. Other experts, however, are uneasy that the availability of a "clean" neutron bomb would blur the distinction between conventional and nuclear weapons. Should war break out, it might make escalation to a nuclear holocaust inevitable.

The so-called "father of the neutron bomb concept" is nuclear weapons analyst Samuel T. Cohen, 56, whose highest academic degree is a bachelor of science from UCLA. Born in Brooklyn, Cohen grew up in Los Angeles in the Depression and worked his way through college—among his jobs, digging graves at Forest Lawn Cemetery. Joining the Army after college, he was recruited to work on the Manhattan Project, which developed the atomic bomb. After the war he was employed by the Rand Corporation for 24 years as a defense specialist. Today he works at top-secret R&D Associates, a Los Angeles research firm. Cohen, an advocate of the neutron bomb since its conception, discussed the weapon with Barbara Wilkins of PEOPLE.

What, exactly, is a neutron bomb?

It's sort of a mini-hydrogen bomb, a micro-mini-hydrogen bomb. It exploits fusion reaction. The explosive release is one ten-thousandth of an

old-fashioned hydrogen bomb.

What are the characteristics of the neutron bomb?

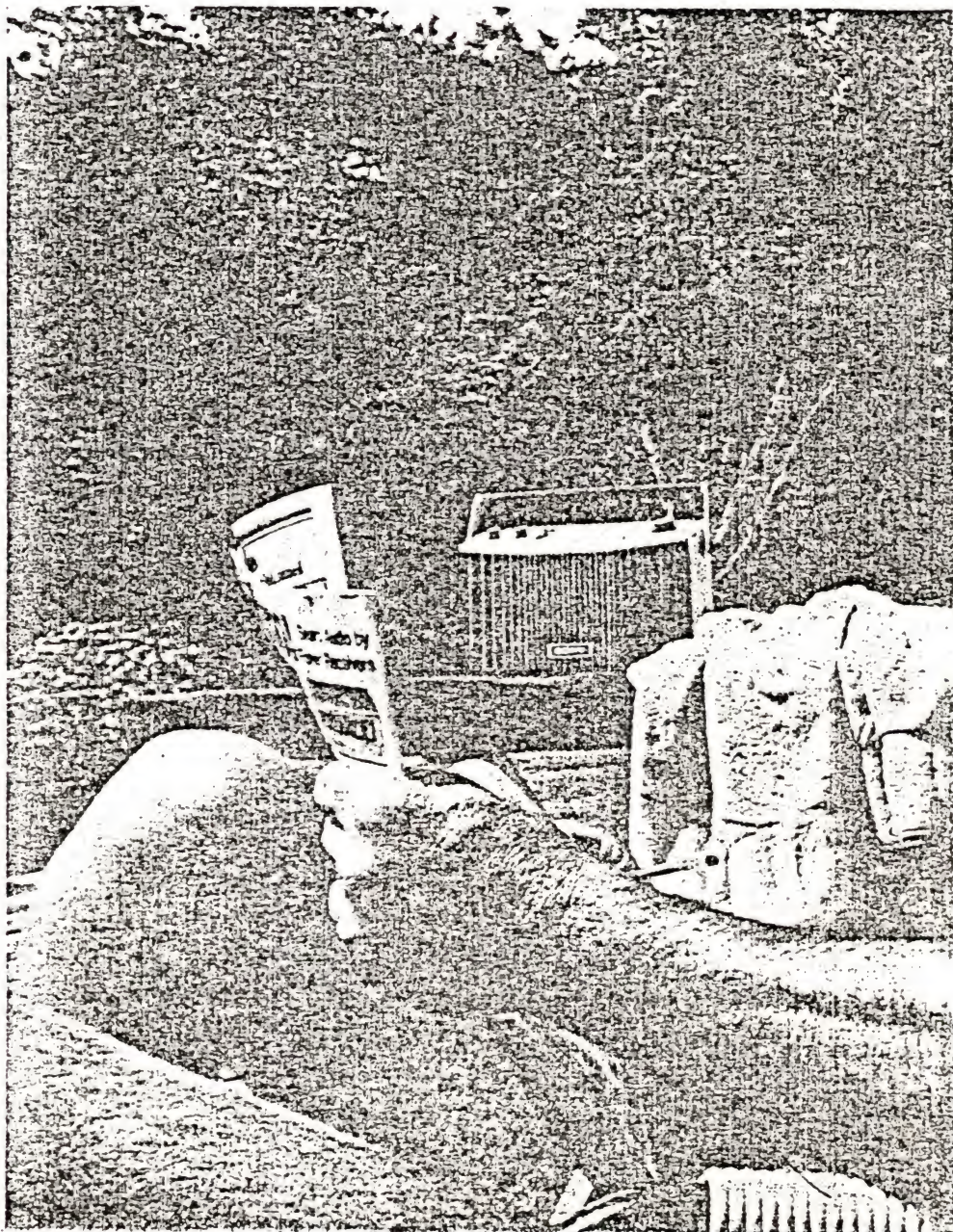
The predominant effect of the two atomic bombs dropped to end World War II was blast. The neutron bomb minimizes blast. Eighty percent of its energy is released in the form of neutrons. This first burst of radiation is what makes it a battlefield kill mechanism.

Where and when would this nuclear weapon be used?

On the battlefield, wherever it is. NATO has planned its defense on the basic premise that an initial attack upon them by the Soviet Union and the Warsaw Pact allies would be with conventional weapons. The most likely scenario is held to be an attack against West Germany.

Why West Germany?

Because it's there. NATO thinks the Soviets are covetous of expanding their ideology and policies. In this scenario, after West Germany is attacked with conventional weapons, NATO



Photographs by Tony Costa

WORDS

would then respond with conventional weapons. If things went awry and the Warsaw Pact allies were on the verge of a breakthrough, then, and only then, would the neutron bomb be used.

What damage to personnel would be caused by a neutron bomb?

It would deliver a neutron dose of about 8,000 rads, a unit of radiation, within half a mile from the explosion. Soldiers exposed to this high dose would be disabled immediately. Troops 1,000 yards away would receive a dose of 3,000 rads; this would incapacitate

them within three to five minutes. They could recover to some degree in about 45 minutes. But due to vomiting, diarrhea and other radiation sickness symptoms, they would be only partially effective and would die within a week. A person three-quarters of a mile away from the center of the explosion would weaken in about two hours and die in a few weeks.

And the bomb doesn't harm property?

No. The radiation is emitted in a millionth of a second and dissipates within a very small fraction of a second. The

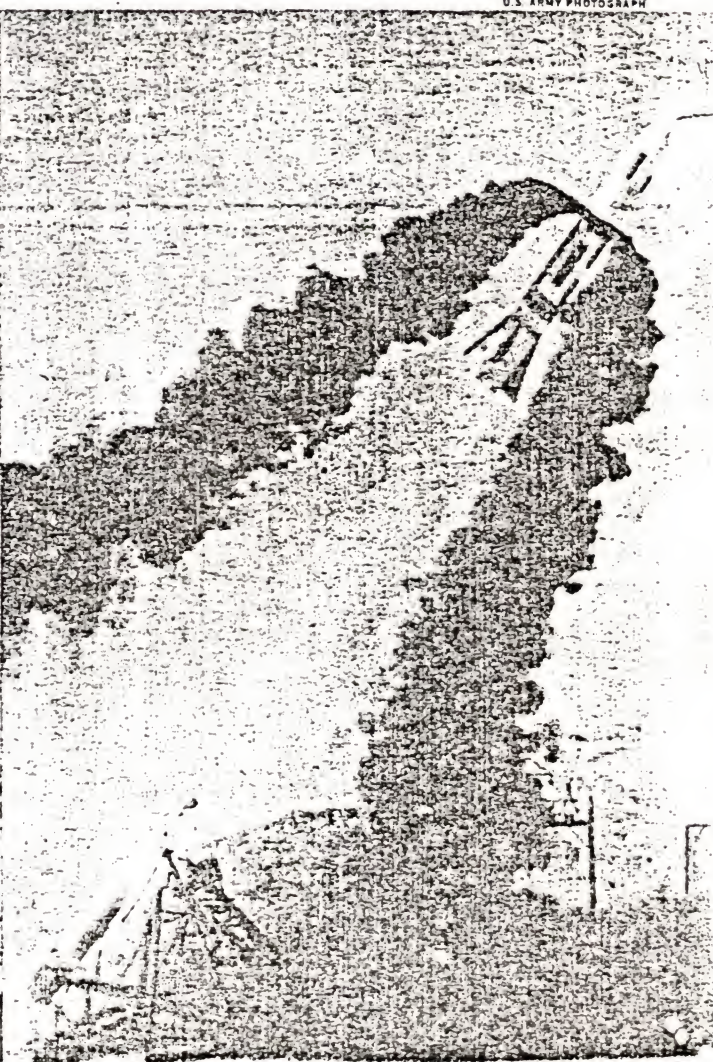
attacked area could be occupied as soon as the troops got there.

Do the Russians have a neutron bomb?

Nobody knows. The Soviets stress that they intend to hit only military targets with tactical nuclear weapons, not cities or population. There is a solid military reason for them to have a neutron bomb. Their doctrine for ground forces is based on a high rate of advance with the use of tanks and armored personnel carriers. They foresee problems with the use of nuclear weapons—urban rubble, making it

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U.S. ARMY PHOTOGRAPH



Relaxing in his yard, Cohen hears over the radio that the Senate will fund the neutron bomb. The device can be delivered from an 8" gun or by Lance missile (above).



The family poodle, Virgie, finds shelter as the Cohens have Sunday breakfast. From left are wife Margaret, daughter Carla, 16, son Paul, 15, Dad and Thomas, 14.

harder for the tanks, and radioactive zones of contamination, dangerous for their own troops.

How did you become involved in the birth of the neutron bomb?

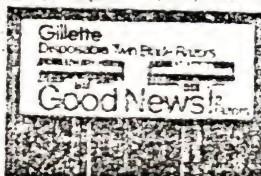
During the 1950s limited warfare became a popular subject with the military. There had been such an enormous revulsion toward fallout that the Atomic Energy Commission began to get worried. Scientists like Edward Teller, Ernest Lawrence and Mark Mills went to the White House in 1957 and told President Eisenhower about this "clean weapon" potential. As a consultant to the Air Force Scientific Advisory Board, I was directed to explore the limited-war applications of "clean" nuclear explosives.

When and where was the neutron bomb devised?

The initial calculations were made in 1958 at the Lawrence Radiation Laboratory in Livermore, Calif. We presented these calculations to the Air

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Force in a briefing at that time, and they couldn't have cared less. So I went home. Then I presented the plan to the Atomic Energy Commission, and in 1959 Livermore began to develop the weapon. A successful version of it was tested underground in early 1963.

Since the neutron bomb has never been tested on people, how do we know what its effects will be?

There have been cases of radiation accidents. One was in 1958 at Los Alamos, another was in Rhode Island some years later. Both people received massive doses. Within a matter of minutes, they were completely incapacitated. During the war a scientist at Los Alamos picked up a radiation dose and got very sick. Nine days later he died. The dose this scientist received compares to the dose the neutron bomb would deliver to enemy soldiers.

What are the arguments against the bomb?

There are two major ones. First, that the neutron bomb enhances the possibility of using nuclear weapons because it won't devastate cities. The argument goes that there is a greater possibility of use because it's a less destructive weapon. President Carter has said, though, that the characteristics of a weapon won't determine the possibility of use.

What is the other major argument?

That it is a kill mechanism. It's considered insidious to kill enemy personnel by radiation. If a soldier is on a battlefield and close enough when an atomic bomb goes off, he will be dead. War is hell. A guy farther out may pick up a lower dosage. Let's suppose he pulls through. He'll have an awful lot of agony—vomiting, cramps, nausea, diarrhea. If he lives, there may be problems later, like leukemia or genetic defects. I find that there is no way of logically grappling with the ways enemy personnel are killed.

How do you think the neutron bomb compares in human damage with conventional warfare?

Drive to a veterans' hospital. There are people without arms, without legs, with organs that don't function. In a weird, almost perverse way, the aftermath of a battle using enhanced

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Still involved in secret research, Cohen keeps fit with jogging, tennis and weight lifting but still smokes half a pack of Salems a day.



Words CONTINUED

radiation weapons is low-level compared to the aftermath of a conventional battle. The greater immorality isn't the kill mechanism, but the war itself. In a strange way, you can say these weapons are moral.

If the Russians did begin a conventional war and we then stepped over the nuclear threshold by using the neutron bomb, what would prevent all-out nuclear war?

We would like to believe we have enough nuclear deterrents so that they wouldn't do that. Our theory is that when NATO introduced tactical nuclear weapons into its arsenal, it sent the very clear message to the Russians that from then on it was going to be a nuclear war.

Why wouldn't the Soviets strike first with tactical nuclear weapons?

There's no reason to believe that they would let us be the first to use them. To paraphrase military strategist Bernard Brodie of UCLA, "Who would say that in such a deadly duel we would get our choice of weapons?" □

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